Unique Environmental Test Site Saves Millions of Dollars

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Payoff

Significant cost savings can be realized by using the Dover National Test Site (DNTS) to improve monitoring capabilities and develop innovative cost-effective clean-up technologies. DNTS offers researchers the ability to conduct carefully planned demonstrations, involving experimental releases of dense non-aqueous phase liquids (DNAPLs) into portions of an aquifer, for the purpose of demonstrating removal of the test constituents with emerging technologies under well controlled conditions. The facility offers several on-site services, ranging from data acquisition and control system support to technical peer review and field operations oversight assistance.

Accomplishment

The Air Force Research Laboratory's (AFRL's) Materials and Manufacturing Directorate (ML) operates a unique soil and groundwater test site at Dover AFB, DE. This site saves the Department of Defense (DoD), the Air Force and commercial industry millions of dollars while helping to restore the natural environment at hazardous waste sites. The Directorate's Airbase and Environmental Technology Division at Tyndall AFB, FL, operates the DNTS, making it possible for the Air Force to develop innovative technologies for the clean-up of DNAPLs. This accounts for the total mass balance of materials in the subsurface and provides for measurement of the true effectiveness of the contaminant removal.

Background

Soil and groundwater contamination, caused by industrial solvents, poses a significant problem for the nation and constitutes one of the most difficult clean-up challenges because common solvents, such as perchloroethylene (PCE) and trichloroethylene (TCE), were used for many years to maintain weapon systems and are heavier than water. When these solvents are spilled, they tend to filter through the earth below the water table until they encounter a soil layer they cannot penetrate, thus forming a pool. These pools can become a chronic source of contamination to passing groundwater. Unfortunately, they are practically impossible to locate or remove and constitute a problem of tremendous scale and technical complexity. The Materials and Manufacturing Directorate's Airbase and Environmental Technology Division operates the DNTS to develop innovative DNAPL clean up technologies. DNTS was an outcome of the Strategic Environmental Research and Development Program (SERDP), which pioneered the Tri-Service and Environmental Protection Agency (EPA) National Environmental Technology Test Sites (NETTS) program. NETTS is a network of well-characterized test sites where promising new technologies can be field-tested under known conditions against established SERDP NETTS standards. Located on three acres at Dover AFB, DNTS is ML's contribution to the SERDP NETTS program. Its primary focus is the Contained Release Facility, which researches and demonstrates technology for the detection, monitoring and clean up of DNAPLs in the soil and groundwater. Since approximately one-third of the Air Force's contaminated sites have a DNAPL component and subsurface DNAPL clean up appears to be impossible at any price, there is a clear need to better understand DNAPL behavior. DNTS is drawing attention both at home and abroad; so much so, it is now considered a national resource. DNTS offers a way for meeting these vital objectives, while providing researchers with an opportunity to eliminate the uncertainty of DNAPL behavior from their research.